



Traffic Engineering Division

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Agenda

- Introduction
- Neighborhood Traffic Management Program (NTMP)
- Traffic Studies and Reference Guides
- Traffic Signals
- Stop Signs
- School Zones
- Speed Limits



Traffic Engineering Division

- The Traffic Engineering Division is tasked with moving traffic within the City limits in a safe and efficient manner through the proper design and use of traffic control devices
- Coordination with other city and state entities
 - Street Department
 - Texas Department of Transportation (TxDOT)
 - Police Department



Traffic Engineering Division – Responsibilities



- Traffic signal design and installation
- Traffic signal timing plan design and implementation
- Traffic Management Center operation
- Traffic control plan review and coordination for construction projects
- School zone traffic control
- New school construction plan review
- Subdivision plan review
- Street improvement plan review
- Street lighting plan review
- Authorizing the installation of all traffic control devices



Traffic Engineering Division – 2006 Performance Output

- Designed and oversaw the installation of 15 new traffic signals
- 10 new school zone safety flashers
- Reviewed over 1200 subdivision and street improvement projects
- Designed or reviewed over 1500 traffic control plans
- Performed about 2,000 field investigations throughout the city





Traffic Information Brochures





Neighborhood Traffic Management Program (NTMP)



- The NTMP is an initiative that was developed to address ever-increasing concerns regarding the safety and livability of neighborhoods.
- The purpose of the NTMP is to address speeding and short cutting through residential streets.





NTMP – How does it work?



- The NTMP seeks to improve the safety of pedestrians, bicyclists, motorists and all other road users by implementing traffic calming measures in progressive steps.
- The NTMP will always attempt to focus on a neighborhood as a whole, not just one street or intersection.



NTMP – What are traffic calming measures?

- Education
 - Neighborhood Meetings
 - Flyers



- Police Enforcement
 - Police surveillance
 - Speed Trailers





NTMP – Traffic calming measures

- Traffic Calming Devices
 - Signage and pavement striping
 - Landscaping
 - Speed Humps, bulbouts, neck downs
 - Diverters, traffic circles, street closures



Section A-A

NE - Round Rock & Captain Valtr
Eastside - Cosmos, Morgan Marie



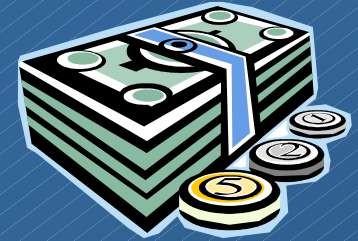
NTMP – How can my neighborhood qualify for this program?

- Neighborhood Watch Program
- Neighborhood Association
- Only Residential Streets
- Fill out NTMP Application
 - Signatures Required (66 %)
- City Web Page - Application





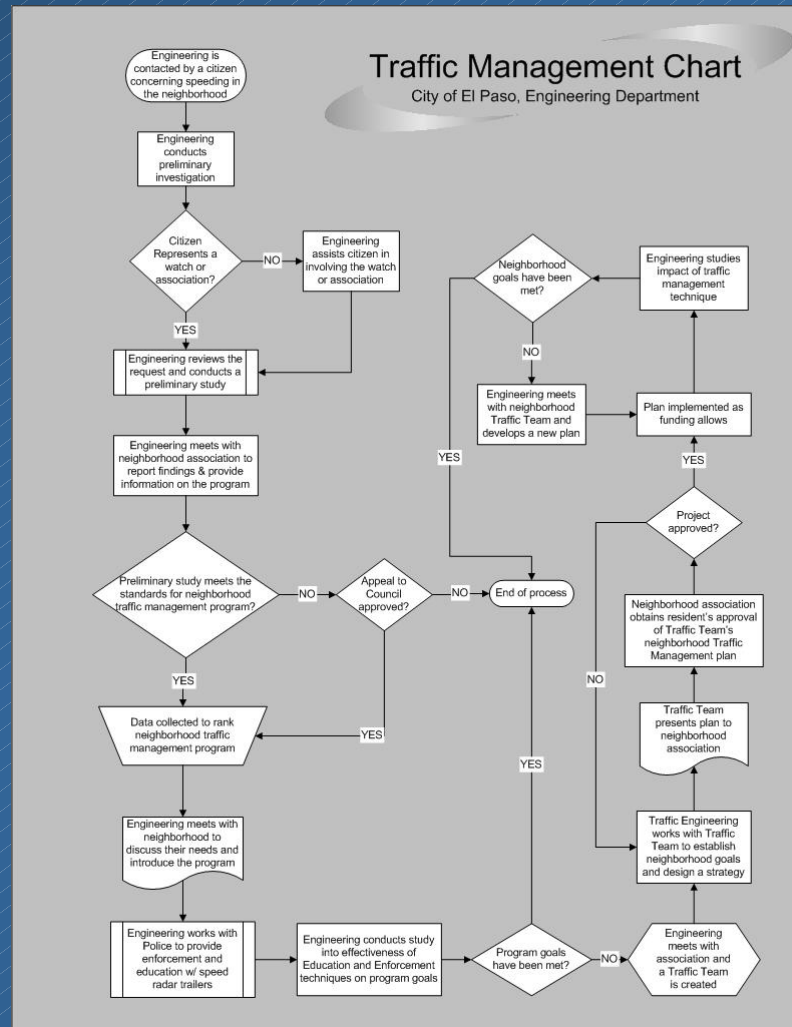
NTMP - Funding



- Neighborhood Watch or Association
- Alternate Source (Donations, etc.)
- City Representative Discretionary Funds
- Waiting List
 - Prioritize by the severity of the neighborhoods situation



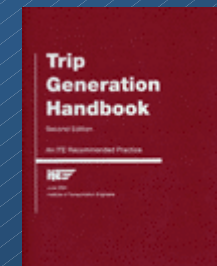
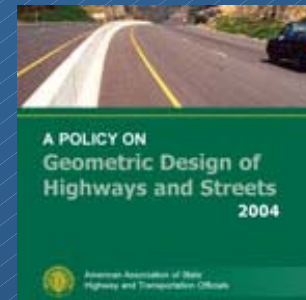
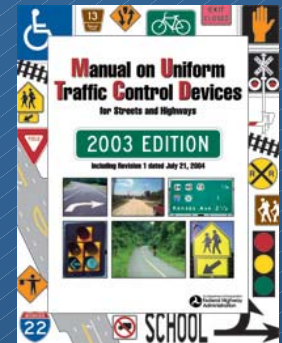
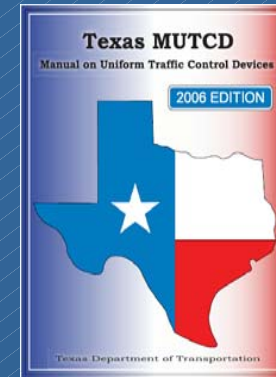
NTMP - Process





Reference Guides

- Texas Manual on Uniform Traffic Control Devices (TMUTCD) 1935
- AASHTO Geometric Design of Highways and Streets
- Trip Generation Book
- El Paso Municipal Code





Traffic Studies



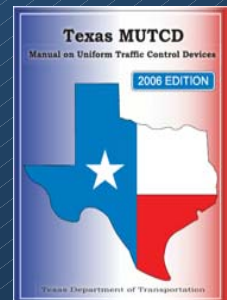
- Mechanical counts
- Manual counts
- Pedestrian counts
- Speed studies
- School studies



Multi-way Stop Warrants



1. *Where traffic control signals are justified, a multi-way stop is an interim measure.*
2. *Crash problem, as indicated by 5 or more crashes in a 12-month period that are susceptible to correction.*
3. *Minimum volumes:*
 1. *Major street avg 300 VPH for any 8 hours*
 2. *Minor street avg combination of 200 VPH and/or pedestrians for the same 8 hours*
 3. *85th-percentile approach speed of major street exceeds 40MPH (65km/h), the minimum vehicular volume warrants are 70 percent of above values.*
4. *Where no single criterion is satisfied, but where all of the above are satisfied to 80 percent of the minimum values*

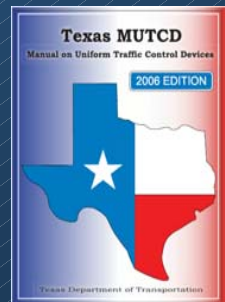




Traffic Signal Warrants



- 1 – Eight-Hour Vehicular Volume
- 2 – Four-Hour Vehicular Volume
- 3 – Peak-Hour
- 4 – Pedestrian Volume
- 5 – School Crossing
- 6 – Coordinated Signal System
- 7 – Crash Experience
- 8 – Roadway Network





Nashville Study

- 5 Warranted Signalized Intersections
- 5 Unwarranted Signalized Intersections
- Observed intersections for 3 years
- Unwarranted Signals – Accidents increased by 300 %
- Warranted Signals – Accidents decreased by 50 %



Traffic Signals



- Traffic Signals, when properly used, can be an invaluable tool for the control of vehicular and pedestrian traffic
- Traffic Signals can provide better flow of traffic, increase capacity, create necessary gaps, and even reduce certain types of accidents
- Unfortunately, traffic signals are not a cure-all answer for all traffic related problems at intersections
- In fact, when traffic signals are used incorrectly, conditions can actually worsen and become a safety hazard



Traffic Signals – Where are they installed?



- An engineering study is first performed to determine whether an intersection qualifies to be signalized – Warranted
- Signal warrants - vehicular volume, pedestrian volume, school crossings, signal coordination and accident information
- Once a traffic signal is approved, it may take anywhere from 1 year to 2 years to design, fund, and construct. On average, a signalized intersection costs about \$120,000



Traffic Signals – How do traffic signals work?

- Controller

- Microprocessor

- Two basic modes of operation

- Pre-timed

- Actuated





Traffic Signals – Pre-timed Intersections



- Specified amount of time for every traffic movement
- Different cycles can be set throughout the day
- Closely spaced and the traffic flow patterns are evenly distributed with high pedestrian traffic, such as in downtown districts



Traffic Signals – Actuated Intersections



- Actuated signalized intersections are more common and widespread throughout the city
- Capable of varying the amount of time they give to a movement based on the traffic they service
- This is the case because actuated intersections have sensors that detect the presence or passage of vehicles. This feature allows any unused green time to go to the movement that needs it
- In theory, actuated signals are more efficient because the signals can adapt to different traffic patterns.



Traffic Signals – How does a traffic signal controller detect vehicles?

● Two types of sensors

■ Inductive loop detection

- Magnetic Field
- Behind stop bar
- Second or third loop detector



■ Video detection

- Installed on Mast Arms
- More flexibility

■ Malfunction

- Street Department 621-6750





Traffic Signals – Are all cameras used for video detection?

- No, some cameras are solely used for observation purposes and are usually only installed on major highways
- These cameras, unlike video detection cameras, have the capability of being controlled by our technicians operating from the Traffic Management Center
- They are used to help engineers see the current traffic conditions, observe traffic patterns, monitor changes and to assist during emergencies
- The City of El Paso does not record or archive any images seen on these cameras
- Red light cameras?



Traffic Management
Center



Traffic Signals – How are signals timed?



- Data collection
 - Traffic counts, geometric considerations, visibility, speed limit, other signals ...
- Signal optimization software
- Different timing scenarios
 - Morning, Afternoon, and Average
- Typical Cycle lengths – 75 seconds to 120 seconds



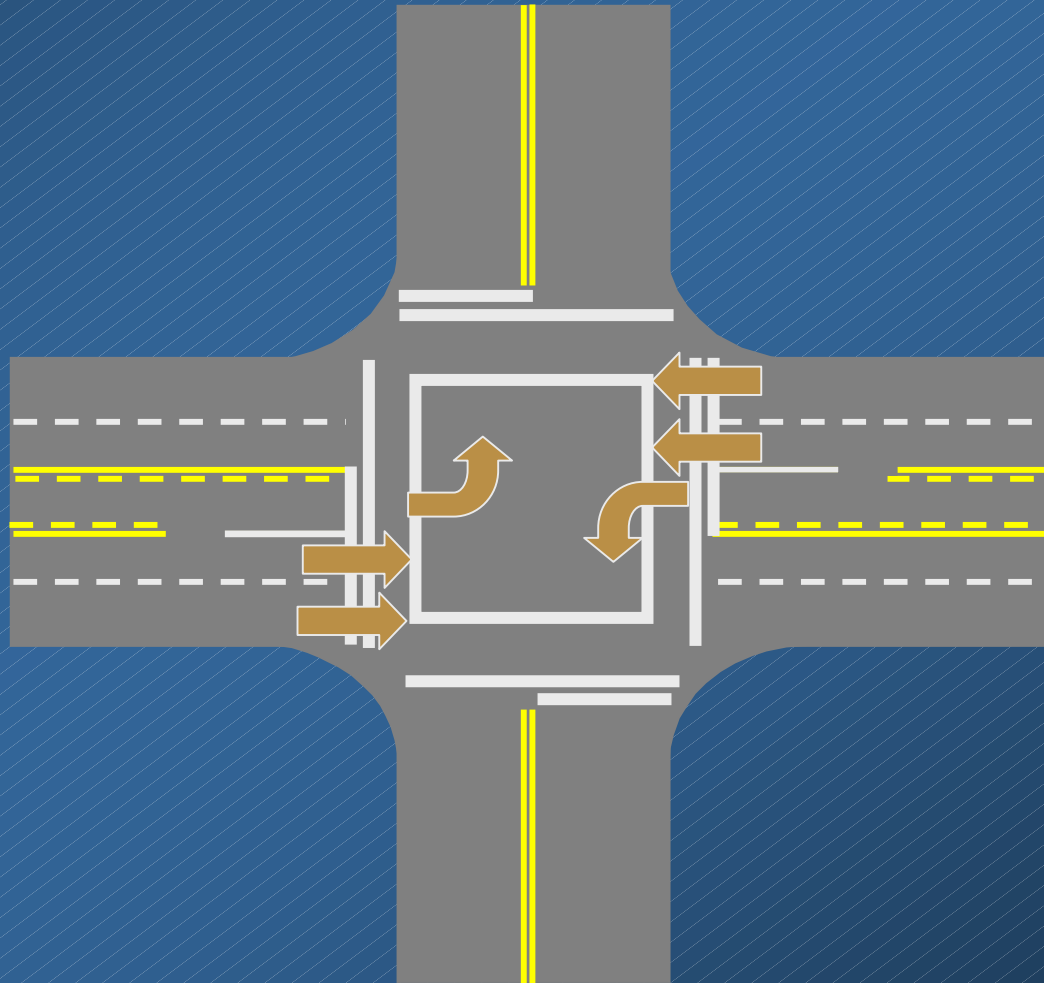
Traffic Signals – Signal Coordination



- Signal coordination helps provide uninterrupted flow of traffic through a series of consecutive signalized intersections
- Arterial streets with closely spaced signals
- Heaviest traffic movements are given precedence over smaller traffic movements
- Side street will typically experience longer wait times
- Capacity, signal spacing, speeding, equipment failure

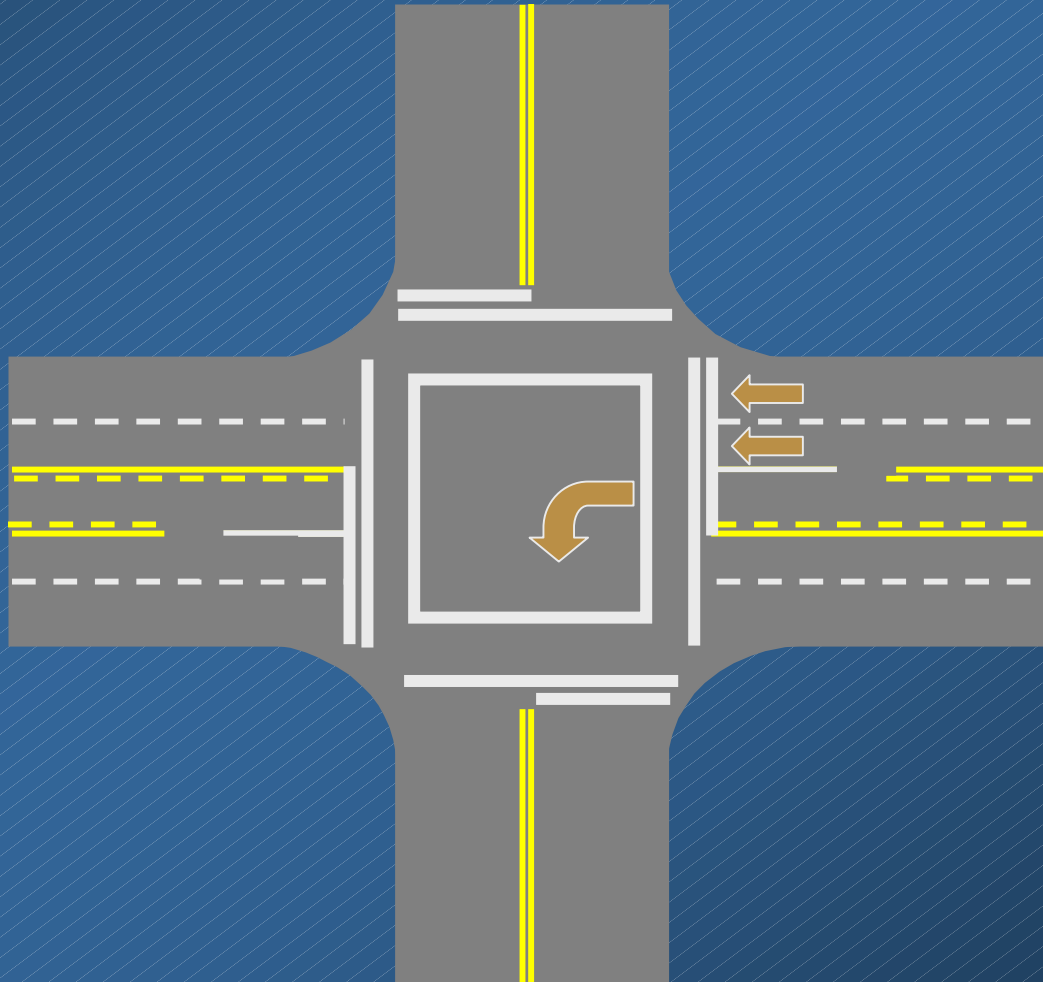


Traffic Signals – Lead-Lead Phasing



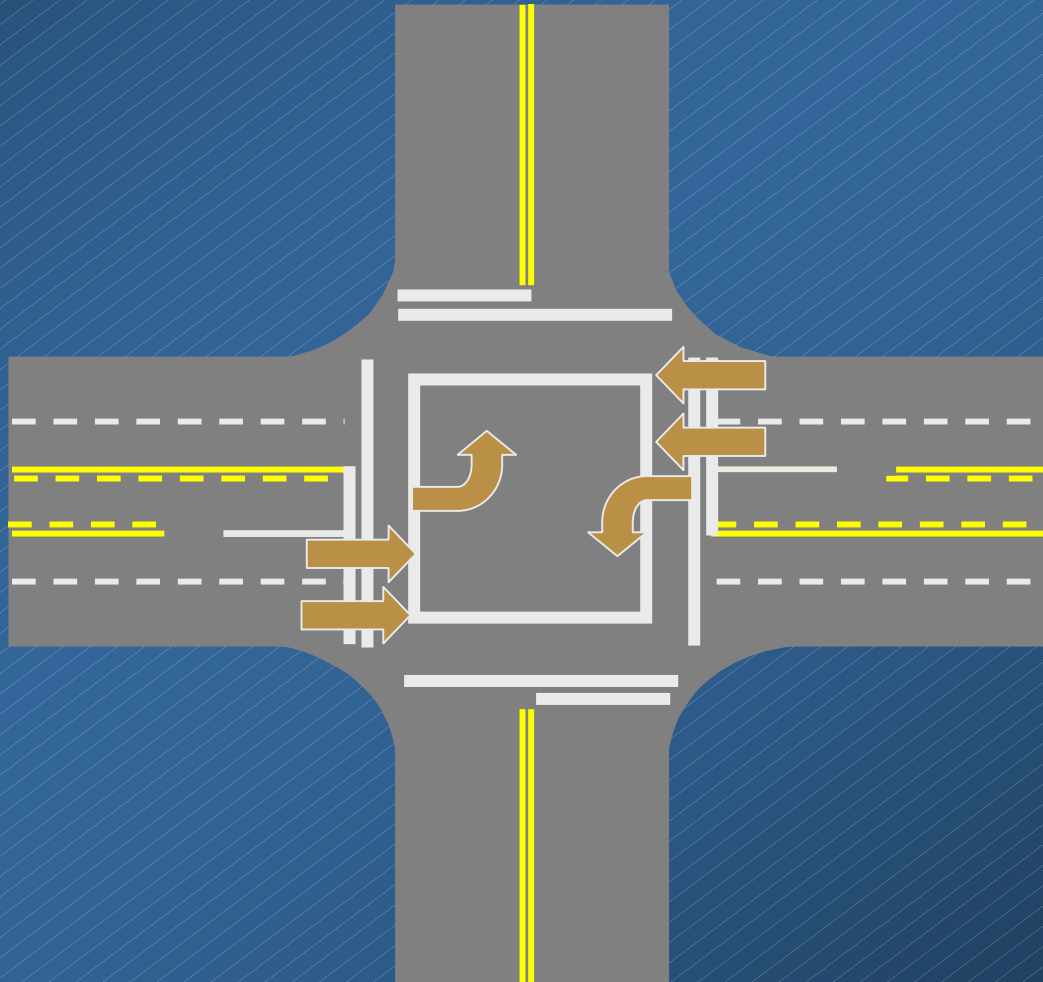


Traffic Signals – Lead-Lag Phasing





Traffic Signals – Split Phasing





Traffic Signals – Pedestrian Signals

1. Do not enter intersection
1. Don't Walk
2. Continue walking if you are already in the intersection

1. Begin to walk
2. Usually not enough time finish crossing

Enough time to walk
from curb to curb





Stop Signs

- A STOP sign is a sign used to direct motorist to stop at the spot where a STOP sign is located
- The purpose of a STOP sign is to provide safe and orderly operation of an intersection that is otherwise not possible without the use of one or more STOP signs





Stop Signs – Will more stop signs slow down traffic?



- Research shows that when STOP signs are used incorrectly, such as for the sole purpose of reducing speeding, the number of intentional violations rises
- Studies show that the speed of vehicles in the immediate area of the STOP sign is reduced, but the speed between intersections increases as a result of motorists making up for lost time
- Most drivers are reasonable, but when they are confronted with what they think are unreasonable and unnecessary restrictions, they are more likely to ignore them



Stop Signs – When are four-way stops recommended?



- Four-way stops, in most cases are only useful when traffic volumes are high and approximately equal on all four approaches. Otherwise, the street carrying the lowest volume of traffic is usually stopped.
- Four-way stop warrants



Multi-way Stop

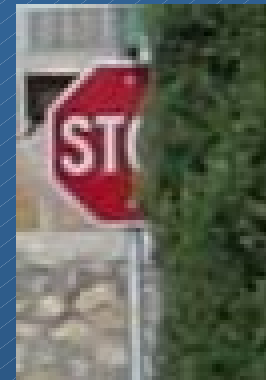


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Stop Signs – Stop sign obstruction

- If a STOP sign is not visible to the driver, then it cannot perform its function
- Please report all obstructions or other perceived safety hazards immediately to the Traffic Division at 541-4050 or Street Department at 621-6861



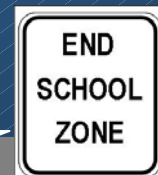
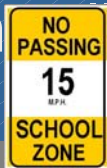


School Zones

- A school safety zone is a section of roadway with a reduced speed limit that contains a school crossing. The school safety zone begins at the point where the reduced speed limit sign is located and continues to the spot where the "End School Zone" sign is located.



- School zones are intended to help school children cross streets safely. They are not installed solely for controlling speed on a public roadway.





School Zones – How are school safety zones established?

- A school safety zone is established through a combination of data collection, engineering studies and coordination with school officials
- Principal – Written Request
- Conduct study
- Install school zone



School Zones – Types of School Zones

● School Sallies Safety Zone

- Signs denote the beginning and ending of zone
- Provide good visibility
- School is responsible for operation
- 45 minutes before school starts
- 30 minutes after school ends





School Zones – Types of School Zones

● Permanent School Safety Zones

- Installed off to the side of the roadway
- Installed with a supplemental time plate sign designating the times the school safety zones are in operation (7 AM to 4 PM)
- Usually installed where school sallies are not advisable





School Zones – Types of School Zones

● School Zone Safety Flashers

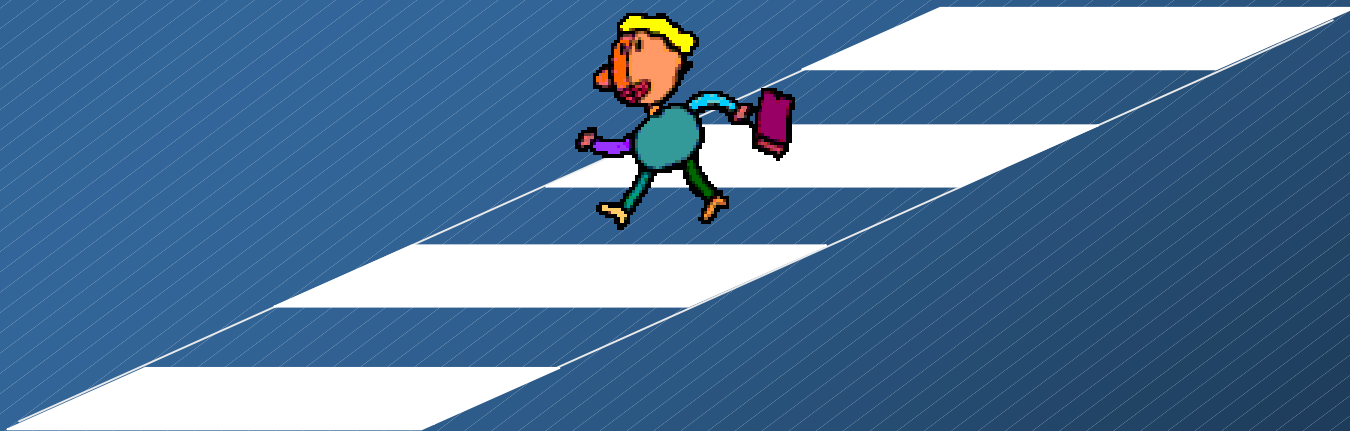
- These zones have electronic or mechanically operated signs equipped with flashing lights
- Zone is in operation only when the lights on the sign are flashing
- Installed on major arterials (35 mph or more)
- School pays 60% of the cost (\$30,000)
- Flashers are pre-programmed based on school bell schedule and calendar
- 45 minutes before, 30 minutes after





School Zones – Where should pedestrians cross the street in a school zone?

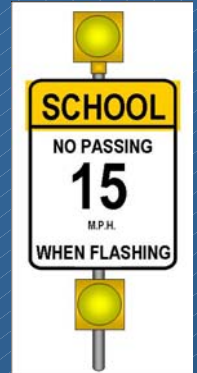
- Simply put, at the crosswalk is the only place that pedestrians are permitted to cross the street in a school zone





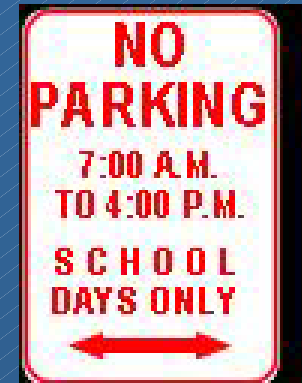
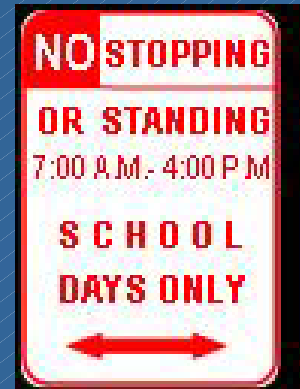
School Zones – Speed limits

- Speed limits vary (15 mph to 35 mph)
- The City only allows a 20 mph maximum reduction of the regular posted speed limit, but in no case can the speed limit be less than 15 mph
- State roadways, however, are only allowed a 15 mph maximum reduction by state law





School Zones – Signs





Speed Limits – What is the Law?

- “All drivers are required to obey posted maximum and minimum speed limits. These limits are designed to provide for the orderly flow of traffic under normal driving conditions. During periods of heavy traffic, inclement weather, low visibility, or other poor driving conditions, speed must be adjusted so that accidents will be avoided.”

Texas Drivers Handbook



Speed Limits – In the absence of posted speed limits

	Daytime (mph)	Nighttime (mph)
● Alleys	15	15
● Urban Districts	30	30
● State Highways	70	65



Speed Limits – How are speed zones established?

Road Classification	Roadway	Lanes	Speed
Minor Residential	20 ft.	2	30 mph
Major Residential	28 ft.	2	30 mph
Residential Subcollector	36 ft.	2	30 mph
Collector Arterial	44 ft.	4	35 mph
Minor Arterial	56 ft.	4	40 mph
Major Arterial	66 ft.	6	45 mph
Super Arterial	88 ft.	8	50 mph

85 % Speed – the speed at which 85 % of the traffic is traveling at or below



Speed Limits – How are speed zones established?

- Road characteristics, shoulder condition, grade, alignment, and sight distance
- The speed traffic flows at, the pace speed
- Roadside development and environment
- Parking practices and pedestrian activity
- Reported crash experience for at least a 12-month period



Speed Limits – Will a lower posted speed limit help reduce speeds?

- No, it is only a myth that posting lower speed limits will cause motorists to slow down and will reduce accidents
- Motorists are influenced by the type of road and the prevailing traffic conditions, and not by the posted speed limit
- Before and after studies have confirmed that changes to the posted speed limit has no effect on the speed of vehicles or safety